



Risk Reduction Through Emergency Preparedness

A Hurricane Tested Solution



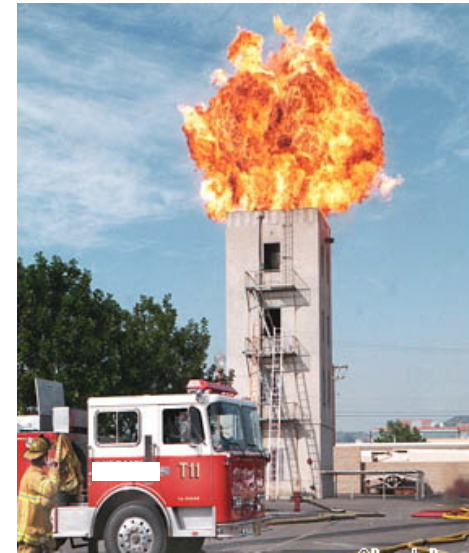
Steve Hoffman
Doug Gray



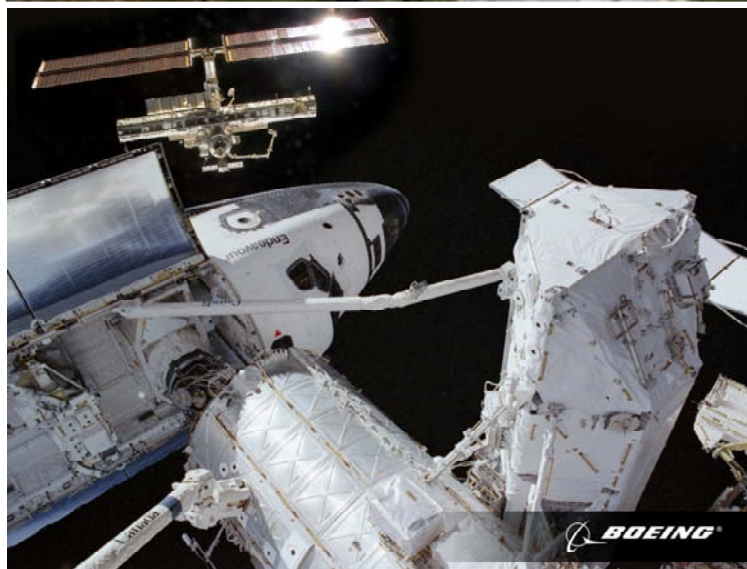
Natural Disasters Occur



Are You Prepared?



Spacecraft Services



People, Facilities, Flight Hardware

Spacecraft Processing



Hubble Revisit



Node 2 and JEM



S0 Truss



MRO



International Assets

Emergency Preparedness



◆ Publish Two Unique Plans – Updated Annually

- Emergency Preparedness Plan (EPP)
 - Loss of Utilities
 - Severe Weather/Tornado
 - Freeze Condition
 - Commodity Leak
 - Fire
 - Civil Disturbance
 - Nuclear, Biological or Chemical Agent Release
 - Sabotage/Bomb Threat
 - Inadvertent Space/Missile Impact
- Hurricane Preparedness Plan (HPP)
 - 100% Focus on Hurricanes
 - Broke out from EPP in 2006 (Lessons Learned)

Planning is Critical

Emergency Preparedness



♦ EPP/HPP Contents

- Program Level Preparation Based Upon Timeliness of Event
 - Tornado Warning versus Watch
 - Adverse Weather – Different Levels Require Different Preps
 - Phase 1 versus Phase 2
 - Hurricanes – Preparation Based upon Estimated Time of Landfall
 - Numerous Require Immediate Action
- Individual Level Preparation Based Upon Timeliness of Event
 - Same as above



Severity and Timing Dictates Planning

Emergency Preparedness



♦ EPP/HPP Contents

- Scripted Scenarios to Immediately Deal with Event
- Preparations
 - Employees
 - Flight Hardware
 - Facility
 - Equipment/Vehicles/Computers
- Communications (Internal & External)
 - Establish Program Comm Plan/Regular Tagups
- Activate Local Operations Center & Boeing EOC
- Finalize Ride Out Crew for Hurricanes
- Organize Damage Assessment & Recovery Team (DART)



Details...Details...Details

Area Map – Florida Space Coast



Shuttle Launch Complex

KSC Industrial Area

- Space Station Processing Facility
- Operations & Checkout Building
- Multi-Purpose Processing Facility

**International Space
Research Park TM**

**SPACEHAB Payload
Processing Facility (SPPF)**

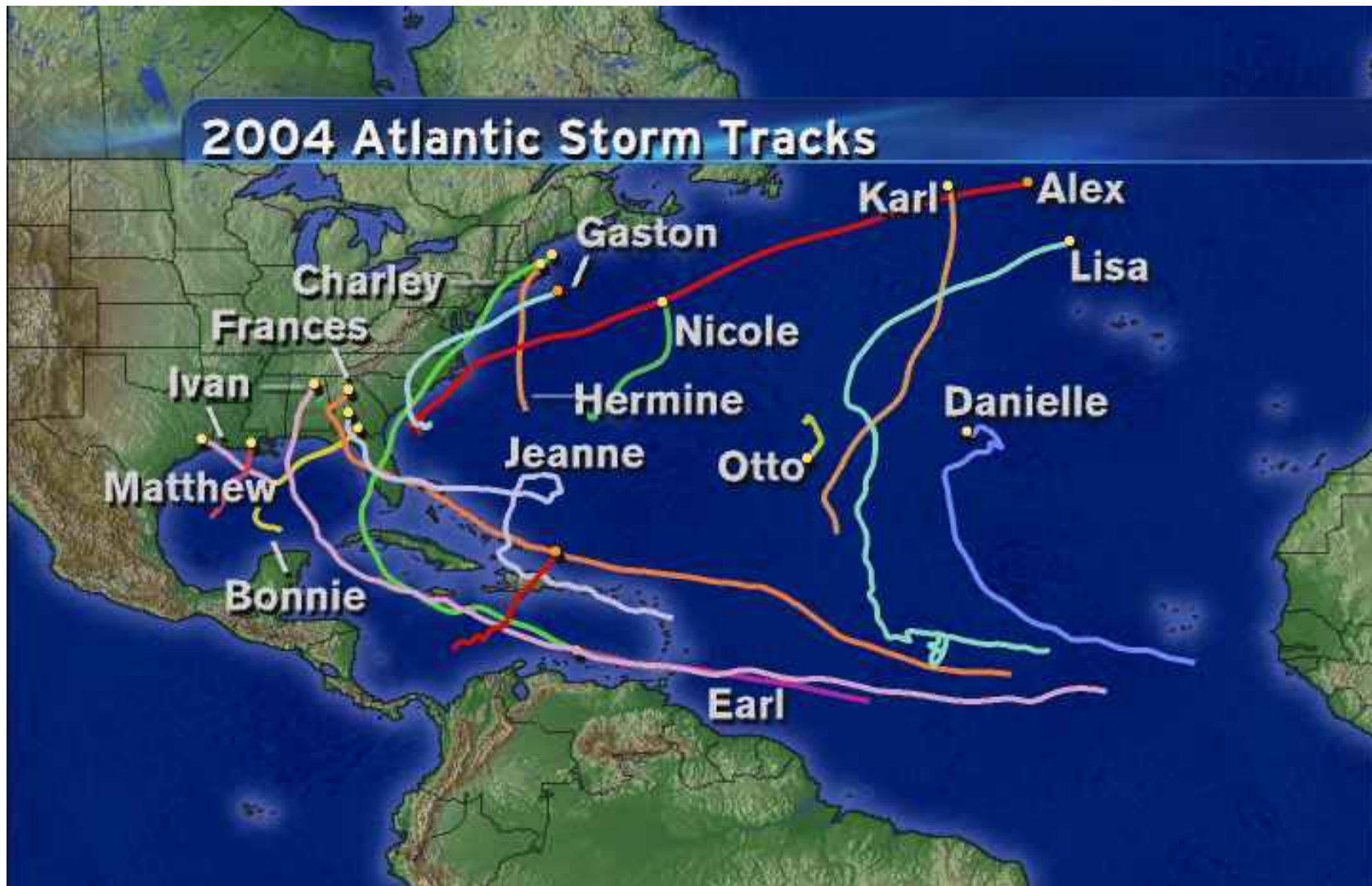
**Port Canaveral
& Intracoastal Waterway**

Boeing Building 100

Space Coast Regional Airport

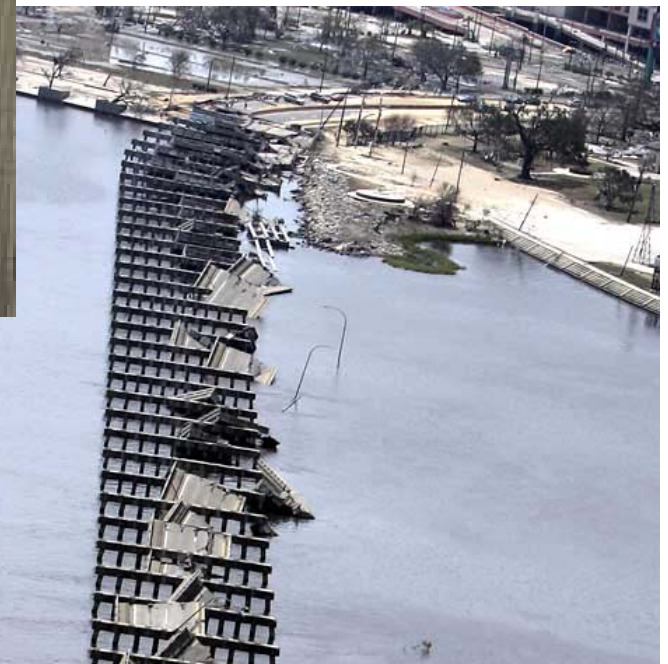
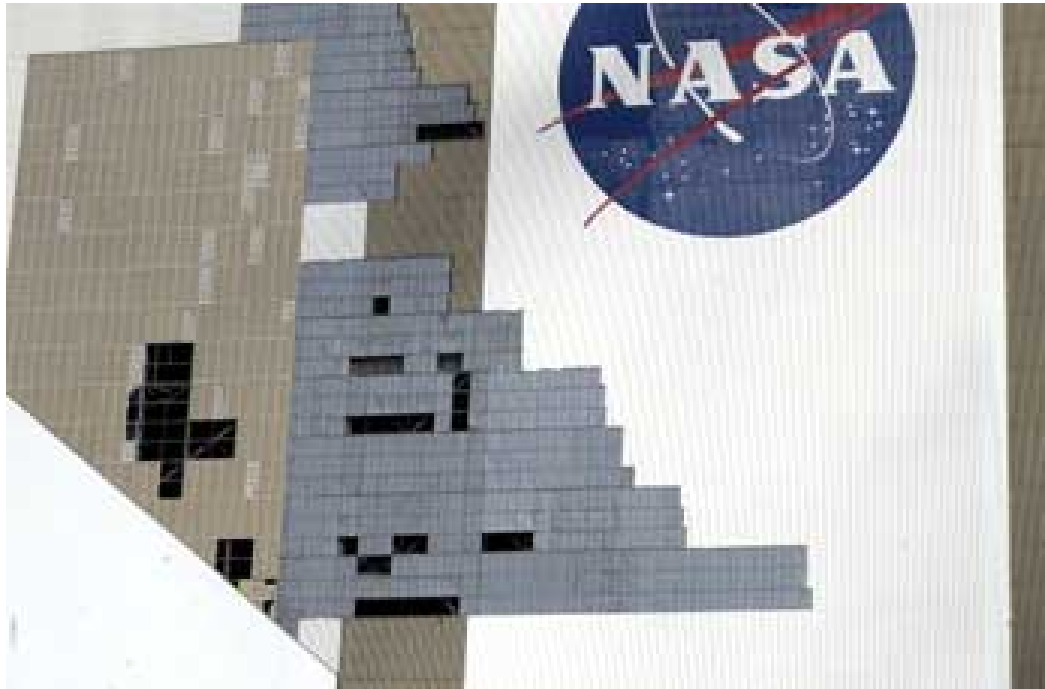
Protecting Space Coast Assets

2004 Hurricane Season



A Season to Never Forget

2004 Effects on KSC

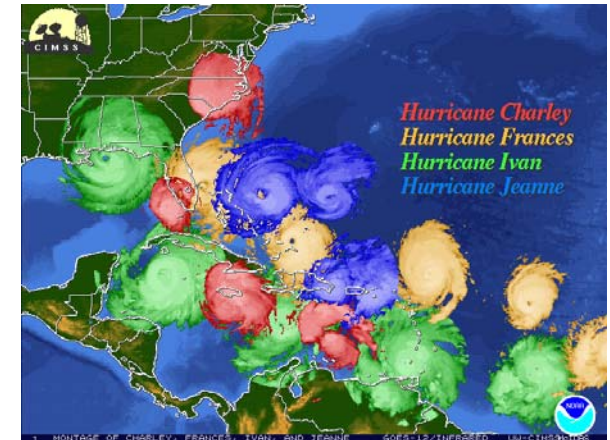


Extensive On Site Damage & Off Site Infrastructure

2004 Effects on KSC



- ♦ Hurricane Charley
 - 24 Hours Out Appeared to be No Threat
 - Turned and Impacted Numerous Employees
- ♦ Hurricane Frances
 - Braced for a Direct Hit/Landfall 75 miles South
 - Shut Down KSC for 5 days
 - Numerous Lessons Learned Primarily on Aftermath Communication
- ♦ Hurricane Jeanne
 - Forecasted to Stay East and Pose No Threat
 - Almost Identical Landfall Location as Frances
 - Better Prepared Based Upon Frances Lessons Learned
 - Continued Damage Started by Frances



Each Situation is Unique

Lessons Learned



♦ Preparation

- Had Established 1-800 Call in Numbers to Facilitate Comm Before, During and After Storms, Required Better Structure
- Moved Critical Flight Hardware To Safer Location
- Identify Critical Skills Prior to Storm in Case of Major Event to Expedite Reestablishment of Critical Systems/Functions



♦ Post Storm

- Cell Phones were Inoperable – Acquired Satellite Phones for Key Personnel
- Personnel Accountability was Not Thorough Enough – Established Method to Communication, but no Guidelines on what to do if we Could Not Make Contact
- Backed Up Servers, but Kept all IT Equipment Resident at Site

Employees Are Your Most Valuable Asset

Lessons Learned



♦ Specific Example

• Dialogic

- Establishes Pre-Determined Scenarios to Communicate With All Employees
- Locates Them Based Upon Pre-Loaded Telephone Numbers to Assure They are Safe Post Storm
- Communicates a Programmed Message from Program Manager to Assure They Have the Latest Information/Plan
- Assures Consistent Timely Information
- Reports Let Manager Know That All are Accounted For or Where to Target Help Needed

Scenario
Activation



Communication is the Key

Forward Work



♦ Katrina 2005 Lessons Learned

- Even Greater Devastation to NASA Center (Michoud)
- Employees Who Were Left Homeless
- Numerous Lessons Learned Incorporated into Our Plan, Several We are Still Working on
 - Pre-Purchase of Blocks of Rooms for Employees
 - Pre-Leased Facility in Case of Inoperability
 - Fresh Water Well – Tower With 1 Million Gallon Capacity
 - IT Equipment Procurement – Off Site
 - Mobile Emergency Ops Center



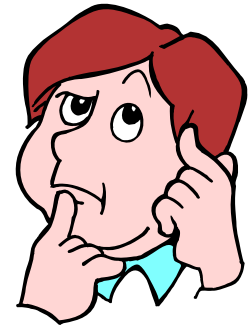
Always Opportunities For Improvement

Post Storm Reflection



- ♦ **What We Thought**

- **Rock Solid Plan for Dealing With Any Circumstance**



- ♦ **What We Discovered**

- **No Matter How Many Times You Simulate an Emergency**
- **No Simulation or Dry Run is Truly Like the Real Thing!**
- **Over 100 Lessons Learned – Incorporated into Current Plan**

- ♦ **Capitalize on Others Experiences & Lessons Learned Without Having To Experience It First Hand**

Don't Learn The Hard Way



Questions & Answers?



Thank You